

1

1 1. A system for measuring distances, the system comprising:
2 a first conductive element conveying a first electromagnetic signal;
3 a second conductive element conveying a second electromagnetic signal based on the
4 first electromagnetic signal;
5 a coupler positioned at a point of interest for coupling the second electromagnetic signal
6 to the second conductive element in response to a change in capacitance associated with the first
7 conductive element caused by the first electromagnetic signal traversing a part of the first
8 conductive element substantially adjacent to the coupler; and
9 a processor determining a distance associated with the point of interest based at least in
10 part on a time delay between the first and second electromagnetic signals.

1 2. The system of claim 1 wherein the first electromagnetic signal exhibits an ultra-wideband
2 frequency.

1 3. The system of claim 1 further comprising a transmitter for forming the first
2 electromagnetic signal.

1 4. The system of claim 1 further comprising a receiver for detecting the time delay between
2 the first and second electromagnetic signals.

1 5. The system of claim 4 wherein the receiver includes an equivalent time sampling circuit.

1 6. The system of claim 1 wherein the first and second conductive elements form a parallel
2 conductor transmission line structure.

- 1 7. The system of claim 1 wherein the first and second conductive elements are flexible.
- 1 8. The system of claim 1 wherein the first and second conductive elements exhibit
2 quadrilateral cross-sections.
- 1 9. The system of claim 1 wherein the first and second conductive elements exhibit
2 substantially identical cross-sections.
- 1 10. The system of claim 1 wherein the coupler exhibits a length corresponding to at least
2 one-quarter of a propagation velocity pulse length of the first electromagnetic signal.
- 1 11. The system of claim 1 further comprising a supporting material for slidably receiving the
2 coupler in a channel defined therein, the supporting material maintaining a consistent
3 displacement between the coupler and the first and second conductive elements.
- 1 12. The system of claim 1 wherein the distance determined by the processor corresponds to a
2 dimension associated with an object.
- 1 13. The system of claim 1 wherein the distance determined by the processor corresponds to a
2 displacement between a plurality of objects.
- 1 14. The system of claim 1 wherein the distance determined by the processor corresponds to
2 an angular orientation.
- 1 15. The system of claim 1 wherein the distance determined by the processor corresponds to a
2 degree of pressure.
- 1 16. A method of measuring distances, the method comprising:

2 transmitting a first electromagnetic signal on a first conductive element;
3 receiving a second electromagnetic signal based on the first electromagnetic signal at a
4 second conductive element, the second electromagnetic signal being coupled to the second
5 conductive element in response to a change in capacitance of the first conductive element caused
6 by the first electromagnetic signal traversing a part of the first conductive element substantially
7 adjacent to a coupler, wherein the coupler is positioned at a point of interest; and
8 determining a distance associated with the point of interest based at least in part on a time
9 delay between the first and second electromagnetic signals.

1 17. The method of claim 16 wherein the distance associated with the point of interest
2 corresponds to a dimension associated with an object.

1 18. The method of claim 16 wherein the distance associated with the point of interest
2 corresponds to a displacement between a plurality of objects.

1 19. The method of claim 16 wherein the distance associated with the point of interest
2 corresponds to an angular orientation.

1 20. The method of claim 16 wherein the distance associated with the point of interest
2 corresponds to a degree of pressure.